

Notes on *Coenonympha semenovi* ALPHÉRAKY, 1887 with description of two new subspecies

(Lepidoptera, Nymphalidae & Satyrinae)

by

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Abstract: The satyrid species *Coenonympha semenovi* ALPHÉRAKY, 1887 is studied in this paper, including its taxonomy, distribution and geographical variation. Two new subspecies, *C. semenovi goateri* subsp. nov. from Lixian, Sichuan Province and *C. semenovi yufei* subsp. nov. from Mts. Qin-Ling, Shaanxi Province are described and illustrated. *Coenonympha semenovi arnoldi* BANG-HAAS, 1934 syn. nov. is a junior synonym of *C. semenovi leanotchka* HEMMING, 1933.

Semenov's heath, *Coenonympha semenovi* ALPHÉRAKY, 1887, is one of the smallest satyrid butterflies in the world and it is a mysterious species with its changeable colours: orange, grey or reddish brown. Whether the wing colour of Semenov's heath varies randomly or geographically? Undoubtedly solving this problem is a base to determine how to classify this species at the intraspecific level. The present author examined material from different localities and strongly believes that the variation of its colour is neither a random case nor a result of different elevations. Instead, different geographical populations with their own colours and wing patterns can be recognised. In this study, former known subspecies of *C. semenovi* ALPH. are studied and two new subspecies are described.

Abbreviations

CNMH: Chongqing Museum of Natural History, Beibei, Chongqing, CHINA.

HT/PT TL: Holotype/paratype/type locality.

IZCAS: Institute of Zoology, Chinese Academy of Sciences, Beijing, CHINA.

LSY: Collection of Songyun Lang, Beibei, Chongqing, CHINA.

SK: Collection of Stanislav Kocman, Ostrava, CZECH.

Coenonympha semenovi ALPHÉRAKY, 1887

ALPHÉRAKY, in ROMANOFF (1887), Mém. Lép. 3: 405. TL: "...de la chaîne Bourkhane-Bouddha (Tsaïdame) ...".

Coenonympha semenovi vera KOCMAN, 1996, Lambillionea 96: 41. TL: China, N. Qinghai, East Chilien Shan, Papao [Babao] (=Chilien [Qilian]).

Distribution: S. Shaanxi, S. Gansu, Qinghai, W. Sichuan, N.E. Tibet.

Coenonympha semenovi semenovi ALPHÉRAKY, 1887 (figs: 10-13, 22, 23)

Material: 1 ♂, CHINA: Qinghai, Yushu, Gyegu, 14.VII.2011, leg. KUI SONG (LSY); 2 ♂♂, CHINA: Qinghai, Huangzhong, N. slope of Lajishan, Lanniwan, 27.VI.2016, leg. HAO HUANG (LSY); Photo, 1 ♂, "PARATYPUS *Coenonympha semenovi vera* ♂ KOCMAN 1996/ CHINA - N. QINGHAI East Chilien Shan Mts. Papao (=Chilien) 3600-3800 m. 16.-21.VII.1995 leg. S. KOCMAN" (SK); 5 ♂♂, 2 ♀♀, CHINA: Qinghai, Datong, Chahanhe, 3100 m, 12.VII.2017, leg. S-Y. LANG (LSY); 1 ♂, CHINA: Qinghai, Datong, Dabanshan Pass, 3850 m, 13.VII.2017, leg. S-Y. LANG (LSY); 2 ♂♂, CHINA: Qinghai, Menyuan, N. of Dabanshan Pass, 3250 m, 13.VII.2017, leg. S-Y. LANG (LSY); 1 ♂, CHINA: Qinghai, Menyuan, N.W. of Qingshizui, 3300 m, 14.VII.2017, leg. S-Y. LANG (LSY); 1 ♂, CHINA: Qinghai, Menyuan, Xianmi, 3100 m, 14.VII.2017, leg. S-Y. LANG (LSY); 7 ♂♂, 5 ♀♀, CHINA: Qinghai, Qilian, Babao, 3250 m, 15.VII.2017, leg. S-Y. LANG (LSY); 1 ♂, CHINA: Qinghai, Qilian, Zhamashi, 2900 m, 16.VII.2017, leg. S-Y. LANG (LSY); 7 ♂♂, CHINA: Qinghai, Qilian, Ebao, Eboling Pass, 3685 m, 16.VII.2017, leg. S-Y. LANG (LSY); 2 ♀♀, CHINA: Tibet, Nagqu, 4600 m, 31.VII.2009, leg. YUFEI LI (LSY).

Diagnosis: On both sides, ground colour is orange.

Distribution: Qinghai (Mts. Burhan Budai, Mts. Qilian, Yushu), N.E. Tibet (Nagqu).

Coenonympha semenovi leanotchka HEMMING, 1933 (figs: 14-18, 24-26)

Coenonympha semenovi var. *obscura* ALPHÉRAKY, in ROMANOFF (1897), Mém. Lép. 9: 111. TL: Ta-tsien-lu [Kangding, Sichuan]. Primary homonym of *Coenonympha leander* var. *obscura* HEYNE, 1894.

Coenonympha semenovi leanotchka HEMMING, 1933, Entomologist 66: 275.

Coenonympha semenovi szechwana BANG-HAAS, 1934, Ent. Z. 47: 110. TL: W. China, Tatsienlu, Putsofong, Howkow [Kangding, Bazifang, Yajiang].

Coenonympha semenovi arnoldi BANG-HAAS, 1934. Ent. Z. 47: 110. TL: Kuku nor mer. or. Alt tau, Hsi king shan [Xiqing-shan, a mountain range between Huanghe and Taohe in Huangnan county of E. Qinghai and Luqu county of S.W. Gansu]. **Syn. nov.**

Material: 1 ♂, CHINA: Sichuan, Kangding, Zheduo Pass, 4000 m, 27.VII.1995 (CMNH); 1 ♀, CHINA: Sichuan, Kangding, Muge Co, 29.VII.2009, leg. S-Y. LANG (LSY); 4 ♂♂, CHINA: Gansu, Maqu, 3500 m, 14.VIII.2006, leg. YUFEI LI (LSY); 3 ♂♂, 1 ♀, CHINA: Gansu, Xiahe, Damai, Xiongmao-gou, 3200 m, 18.VII.2015, leg. GUOXI XUE (LSY); 1 ♂, ditto, 26.VII.2015, leg. HAO HUANG (LSY); 2 ♂♂, 1 ♀, CHINA: Gansu, Xiahe, Damai, 3100 m, 20.VII.2017, leg. S-Y. LANG (LSY); 2 ♀♀, CHINA: Sichuan, Zoige, Dazhasi, 3460 m, 21.VII.2017, leg. S-Y. LANG (LSY); 1 ♂, CHINA: Sichuan, Hongyuan, Rangkou, 3600 m, 22.VII.2017, leg. S-Y. LANG (LSY).

Diagnosis: On dorsal side, ground colour is reddish brown in ♂ and somewhat pale than male in ♀.

Notes: Both, *C. s. leanotchka* HEMMING and *C. s. arnoldi* BANG-HAAS, are dark in colour and their range is continuous from southwestern Gansu to western Sichuan, therefore, the latter is sunk to a junior synonym of the former.

Distribution: S.W. Gansu, E. Qinghai (Maqu Valley), W.&N.W. Sichuan.

Coenonympha semenovi sala KOCMAN, 1995 (figs: 7-9, 21)

Lambillionea 95: 67. TL: Chaka-Wulan, Qinghai.

Material: Photo, 1 ♂, "PARATYPUS *Coenonympha semenovi sala* ♂ KOCMAN, 1995/CHINA - QINGHAI road Chaka-Wulan 3500-4200 m. 9.-13.VII.1994 leg. S. KOCMAN" (SK); 3 ♂♂, CHINA: Qinghai, Hualong, Qingsha Pass, 3200 m, 11.VII.2017, leg. S-Y. LANG (LSY).

Diagnosis: On both sides, ground colour is pale grey.

Notes: This subspecies confines its range only in the southeasternmost ridge-chain of great Mts. Qilian, namely Qinghai-Nanshan in west, and Lajishan in east.

Distribution: Qinghai (Qinghai-Nanshan, Laji-shan).

Coenonympha semenovi goateri subspec. nov. (figs: 1-3, 19)

HT ♂: CHINA: Sichuan, Lixian, Miyalo, 3700-3800 m, 22.VII.2017, leg. S-Y. LANG (CMNH). PT: 13 ♂♂, 1 ♀, ditto, 22-23.VII.2017, leg. S-Y. LANG (LSY).

Etymology: This subspecies is named after Mr. BARRY GOATER (Chandlers Ford, Hampshire, UK) who often works on English corrections of my papers and books and gives me many useful advices.

Diagnosis: The new subspecies can be distinguished from other subspecies by the combination of the following characters:

1. On dorsal side, ground colour is grey, whereas it is orange in *C. s. semenovi* ALPHÉRAKY and reddish brown in *C. s. leanotchka* HEMMING.

2. On dorsal side, veins are finely and clearly outlined with black, whereas in *C. s. sala* KOCMAN and *C. s. yufei* subspec. nov., veins are only weakly outlined with dark.

3. On dorsal side, forewing apical area and hindwing basal area are darker than those of *C. s. sala* KOCMAN.

4. On dorsal side, hindwing submarginal pale spots are well present, whereas they are reduced in *C. s. yufei* subspec. nov.

Notes: BOZANO (2002) illustrated a grey specimen from "Barkham, Qionglai Shan, Sichuan" and it is obvious the same population with the new subspecies here. Though range of this grey subspecies is largely surrounded by *C. s. leanotchka* HEMMING, except its east, it is stable in appearance and has its own territory.

Distribution: Sichuan (north section of Mts. Qionglai).

Coenonympha semenovi yufei subspec. nov. (figs: 4, 5, 20)

HT ♂: CHINA, Shaanxi, Huxian, Zhuque, Bingjing-ding, 2800-3000 m, 30.VI.2009, leg. YUFEI LI (CMNH). PT: 2 ♂♂, CHINA, Shaanxi, Chang'an, 2800 m, 24.VI.2006, leg. YUFEI LI (LSY).

Etymology: The specific name *yufei* is named after Mr. Li YUFEI (Xi'an) who collected the type material of this new subspecies.

Diagnosis: The new subspecies can be distinguished from other subspecies by the combination of the following characters:

1. On dorsal side, ground colour is grey, whereas it is orange in *C. s. semenovi* ALPHÉRAKY and reddish brown in *C. s. leanotchka* HEMMING.

2. On dorsal side, ground colour is tinged with bronze which is absent in *C. s. sala* KOCMAN and *C. s. goateri* subspec. nov.

3. On dorsal side, hindwing submarginal pale spots are vestigial, whereas they are well developed in *C. s. sala* KOCMAN and *C. s. goateri* subspec. nov.

4. On ventral side, hindwing submarginal pale spots are much smaller than those of *C. s. sala* KOCMAN and *C. s. goateri* subspec. nov.

Notes: Semenov's heath is an alpine species and it can extend its range eastwards along alpine zone of Mts. Qin-Ling, the gigantic east-west orientated ridge which separates north and south China. It seems that the zone with enough high altitude (above ca. 2800 m) which is suitable for Semenov's heath is not a continuous belt from eastern fringe of Tibetan Plateau to central section of Qin-Ling, therefore the new subspecies of Semenov's heath discovered from Qin-Ling is geographically well separated from all other subspecies from eastern part of Tibetan Plateau. The distribution pattern of this new subspecies is possibly a result of retreat of the last Pleistocene glaciation.

Distribution: Shaanxi (alpine zone of central section of Mts. Qin-Ling).

Coenonympha semenovi subspec. incert. (fig: 6)

Material: 1 ♂, CHINA: Qinghai, Qumalai, Chumaer-he, 4500 m, 19.VII.2001, leg. YANZHOU ZHANG (IZCAS).

Diagnosis: On both sides, ground colour is yellowish grey with forewing subapical spot and hindwing submarginal spots yellowish, well present.

Notes: Because of only 1 ♂ examined its status needs further study.

Distribution: Qinghai (eastern Hoh Xil).

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Fig. 1: *Coenonympha semenovi goateri* subspec. nov., HT ♂, CHINA: Sichuan, Lixian, SATY0565, CMNH, upperside. **Fig. 2:** *Coenonympha semenovi goateri* subspec. nov., PT ♂, CHINA: Sichuan, Lixian, LSY, upperside. **Fig. 3:** *Coenonympha semenovi goateri* subspec. nov., PT ♀, CHINA: Sichuan, Lixian, LSY, upperside. **Fig. 4:** *Coenonympha semenovi yufei* subspec. nov., HT ♂ CHINA: Shaanxi, Huxian, SATY0567, CMNH, upperside. **Fig. 5:** *Coenonympha semenovi yufei* subspec. nov., PT ♂, CHINA: Shaanxi, Chang'an, LSY, upperside. **Fig. 6:** *Coenonympha semenovi* subspec. incert., ♂, CHINA: Qinghai, Qumalai, NYMP0891, IZCAS, upperside. **Fig. 7:** *Coenonympha semenovi sala* KOCMAN, 1995, PT ♂, CHINA: Qinghai, Chaka-Wulan, SK, upperside. **Fig. 8:** *Coenonympha semenovi sala* KOCMAN, 1995, ♂, CHINA: Qinghai, Hualong, LSY, upperside. **Fig. 9:** *Coenonympha semenovi sala* KOCMAN, 1995, ♂, CHINA: Qinghai, Yushu, SATY0566, LSY, upperside. **Fig. 10:** *Coenonympha semenovi semenovi* ALPHÉRAKY, 1887, ♂, CHINA: Qinghai, Datong, LSY, upperside. **Fig. 11:** *Coenonympha semenovi semenovi* ALPHÉRAKY, 1887, ♂, CHINA: Qinghai, Datong, LSY, upperside. **Fig. 12:** *Coenonympha semenovi semenovi* ALPHÉRAKY, 1887, ♂, CHINA: Qinghai, Qilian, SATY0569, LSY, upperside. **Fig. 13:** *Coenonympha semenovi semenovi* ALPHÉRAKY, 1887, ♂, CHINA: Sichuan, Kangding, SATY0572, CMNH, upperside. **Fig. 14:** *Coenonympha semenovi leanotchka* HEMMING, 1933, ♂, CHINA: Sichuan, Kangding, SATY0572, CMNH, upperside. **Fig. 15:** *Coenonympha semenovi leanotchka* HEMMING, 1933, ♀, CHINA: Sichuan, Zoige, LSY, upperside. **Fig. 16:** *Coenonympha semenovi leanotchka* HEMMING, 1933, ♂, CHINA: Gansu, Xiahe, LSY, upperside. **Fig. 17:** *Coenonympha semenovi leanotchka* HEMMING, 1933, ♂, CHINA: Gansu, Xiahe, LSY, upperside. **Fig. 18:** *Coenonympha semenovi leanotchka* HEMMING, 1933, ♀, CHINA: Gansu, Xiahe, LSY, upperside.

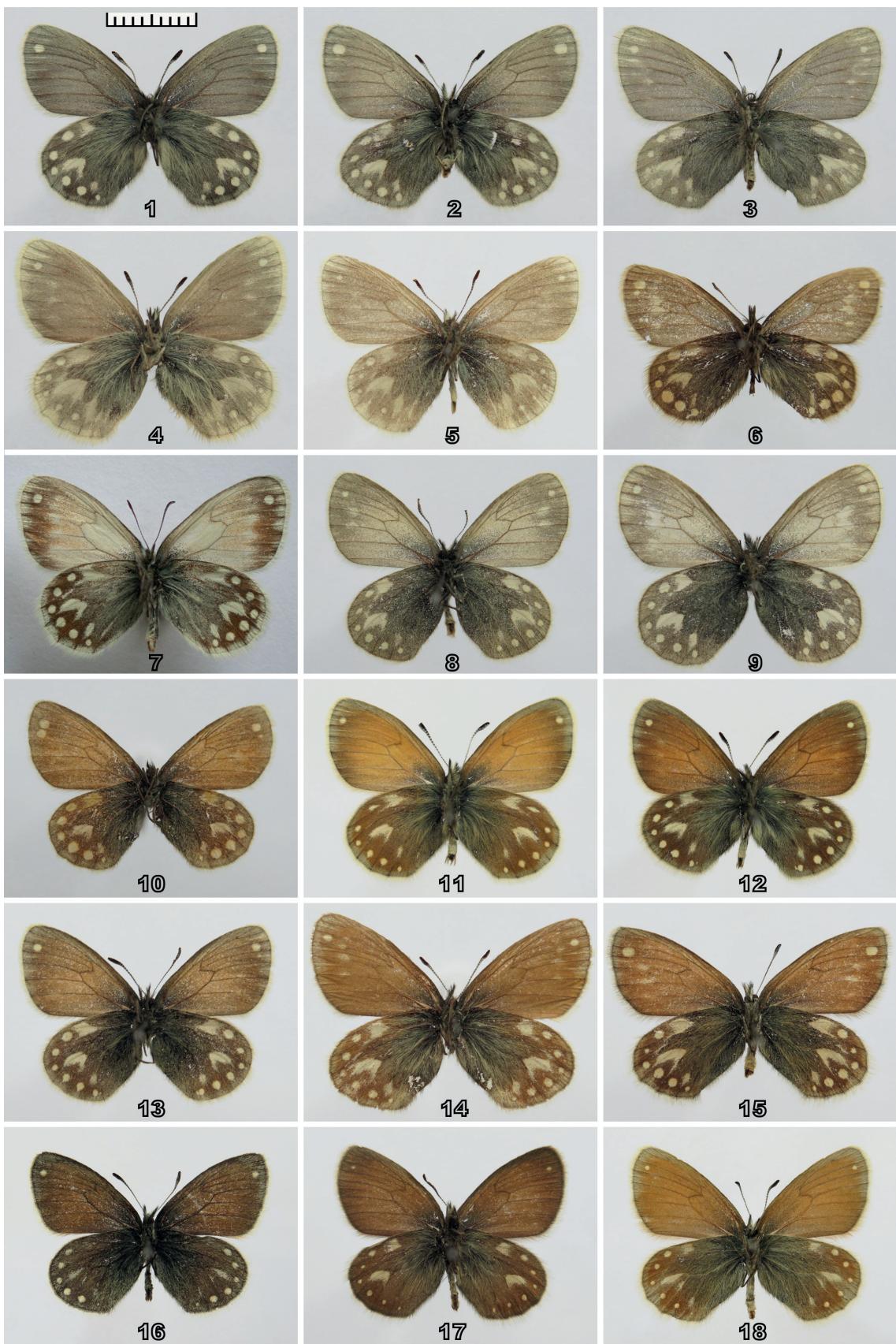


Fig. 1: *Coenonympha semenovi goateri* subspec. nov., HT ♂, CHINA: Sichuan, Lixian, SATY0565, CMNH, underside. **Fig. 2:** *Coenonympha semenovi goateri* subspec. nov., PT ♂, CHINA: Sichuan, Lixian, LSY, underside. **Fig. 3:** *Coenonympha semenovi goateri* subspec. nov., PT ♀, CHINA: Sichuan, Lixian, LSY, underside. **Fig. 4:** *Coenonympha semenovi yufei* subspec. nov., HT ♂ CHINA: Shaanxi, Huxian, SATY0567, CMNH, underside. **Fig. 5:** *Coenonympha semenovi yufei* subspec. nov., PT ♂, CHINA: Shaanxi, Chang'an, LSY, underside. **Fig. 6:** *Coenonympha semenovi* subspec. incert., ♂, CHINA: Qinghai, Qumalai, NYMP0891, IZCAS, underside. **Fig. 7:** *Coenonympha semenovi sala* KOCMAN, 1995, PT ♂, CHINA: Qinghai, Chaka-Wulan, SK, underside. **Fig. 8:** *Coenonympha semenovi sala* KOCMAN, 1995, ♂, CHINA: Qinghai, Hualong, LSY, underside. **Fig. 9:** *Coenonympha semenovi sala* KOCMAN, 1995, ♂, CHINA: Qinghai, Hualong, SATY0568, LSY, underside. **Fig. 10:** *Coenonympha semenovi semenovi* ALPHÉRAKY, 1887, ♂, CHINA: Qinghai, Yushu, SATY0566, LSY, underside. **Fig. 11:** *Coenonympha semenovi semenovi* ALPHÉRAKY, 1887, ♂, CHINA: Qinghai, Datong, LSY, underside. **Fig. 12:** *Coenonympha semenovi semenovi* ALPHÉRAKY, 1887, ♂, CHINA: Qinghai, Qilian, SATY0569, LSY, underside. **Fig. 13:** *Coenonympha semenovi semenovi* ALPHÉRAKY, 1887, ♂, CHINA: Sichuan, Kangding, SATY0572, CMNH, underside. **Fig. 15:** *Coenonympha semenovi leanotchka* HEMMING, 1933, ♀, CHINA: Sichuan, Zoige, LSY, underside. **Fig. 16:** *Coenonympha semenovi leanotchka* HEMMING, 1933, ♂, CHINA: Gansu, Xiahe, LSY, underside. **Fig. 17:** *Coenonympha semenovi leanotchka* HEMMING, 1933, ♀, CHINA: Gansu, Xiahe, LSY, underside. **Fig. 18:** *Coenonympha semenovi leanotchka* HEMMING, 1933, ♀, CHINA: Gansu, Xiahe, LSY, underside.

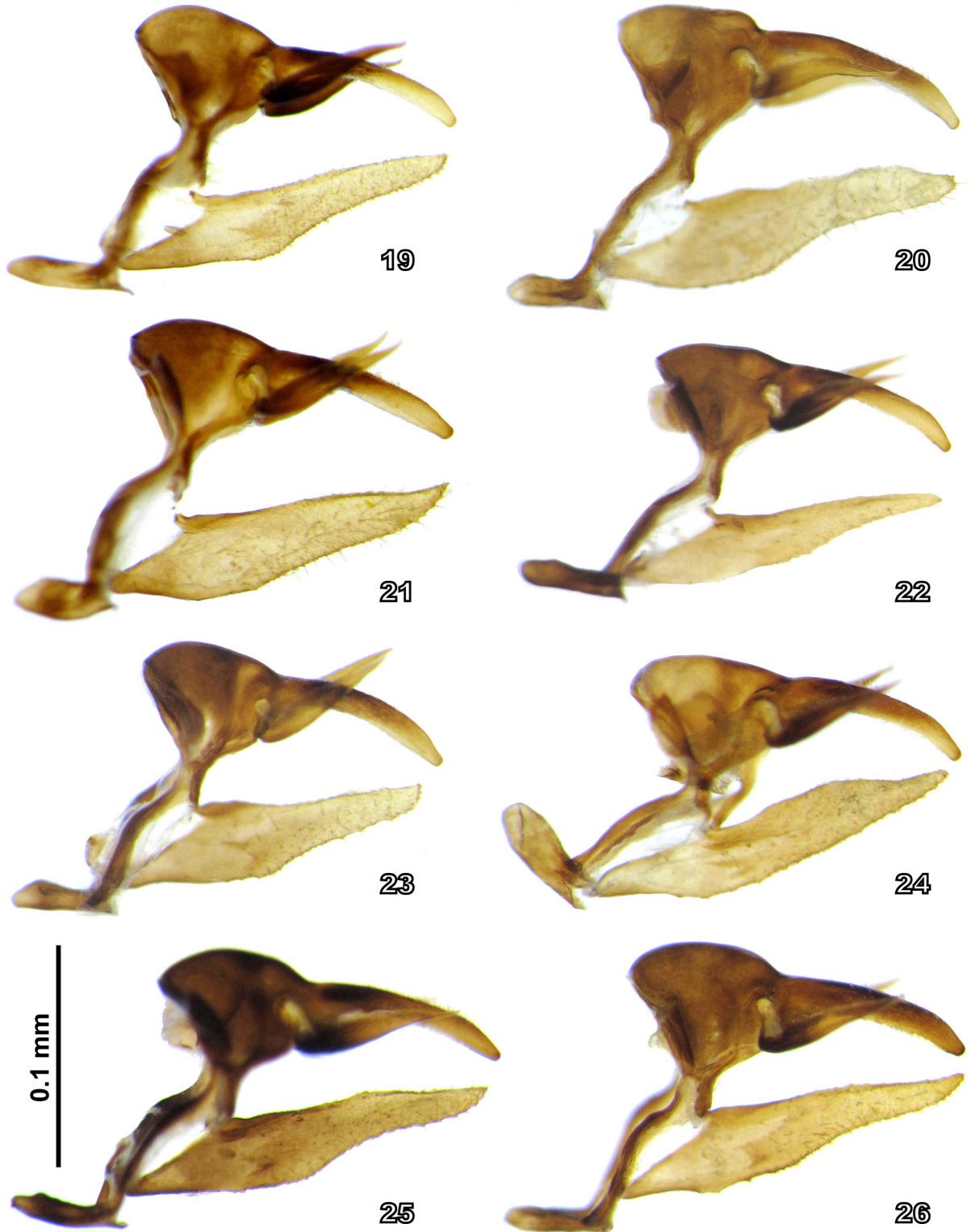


Fig. 19: ♂ genitalia of *Coenonympha semenovi goateri* subsp. nov. in lateral view with left valva and aedoeagus removed, HT, CHINA: Sichuan, Lixian, SATY0565, CMNH.

Fig. 20: ♂ genitalia of *Coenonympha semenovi yufei* subsp. nov. in lateral view with left valva and aedoeagus removed, HT, CHINA: Shaanxi, Huxian, SATY0567, CMNH.

Fig. 21: ♂ genitalia of *Coenonympha semenovi sala* KOCMAN, 1995 in lateral view with left valva and aedoeagus removed, CHINA: Qinghai, Hualong, SATY0568, LSY.

Fig. 22, 23: ♂ genitalia of *Coenonympha semenovi* ALPHÉRAKY, 1887 in lateral view with left valva and aedoeagus removed (22): CHINA: Qinghai, Yushu, SATY0566, LSY, (23) CHINA: Qinghai, Qilian, SATY0569, LSY.

Fig. 24-26: ♂ genitalia of *Coenonympha semenovi leanotchkai* HEMMING, 1933 in lateral view with left valva and aedoeagus removed, (24) CHINA: Gansu, Maqu, SATY0570, LSY, (25) ♂, CHINA: Sichuan, Hongyuan, SATY0571, LSY, (26), CHINA: Sichuan, Kangding, SATY0572, CMNH.

Map of S.W. China

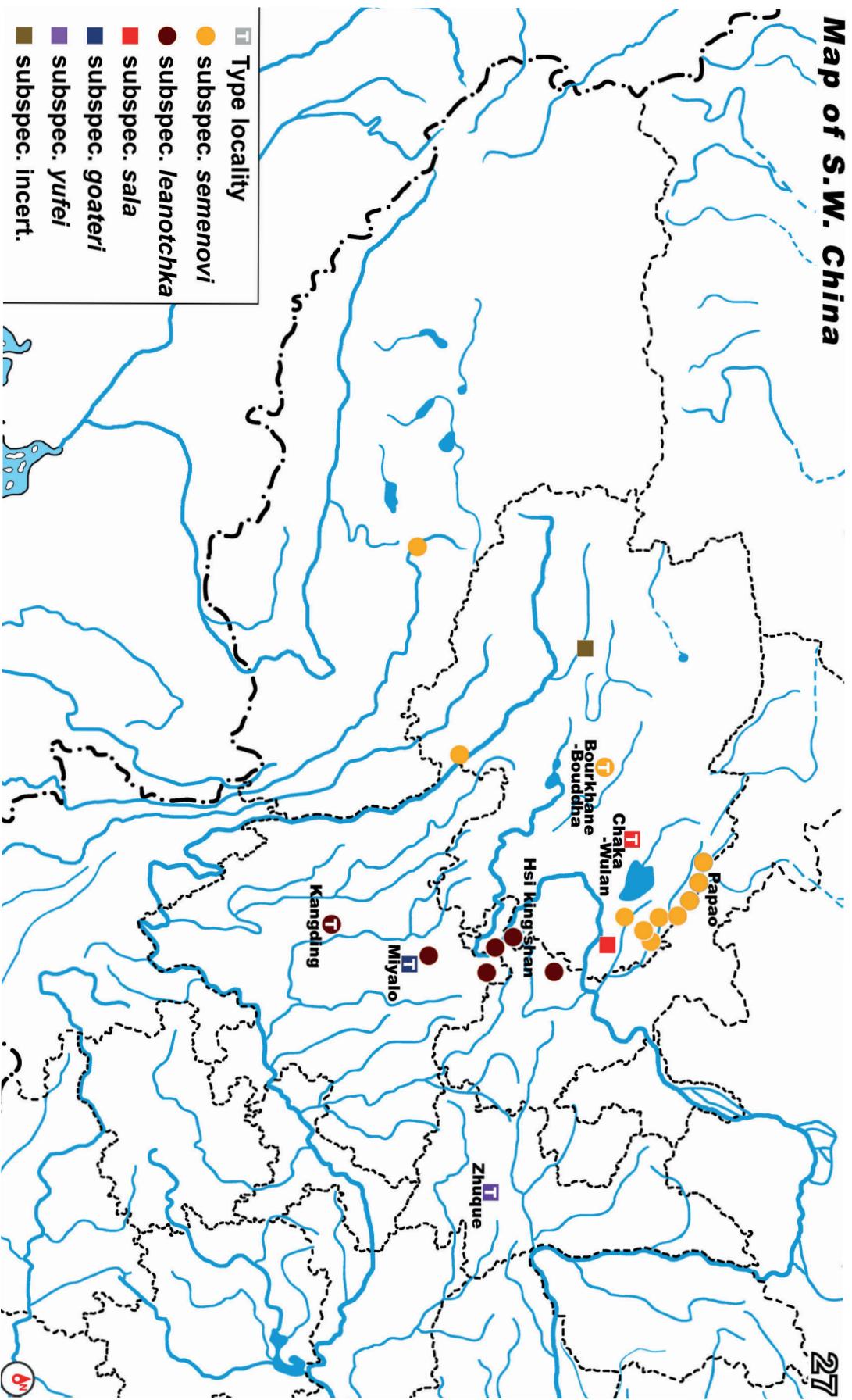


Fig. 27: Distribution of *Coenonympha semenovi* ALPHÉRAKY, 1887.

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